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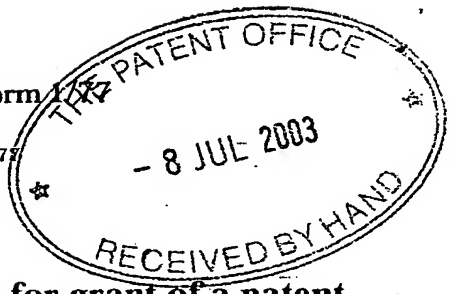

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09JUL03 E821098-3 D02890
P01/7700 0.00-0315972.0

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
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1. Your reference — RSJ07810GB

2. Patent application number *(The Patent Office will fill in this part)* — 08 JUL 2003 — 0315972.0

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

   Ishida Europe Limited
   11 Kettles Wood Drive
   Woodgate Business Park
   Birmingham, B32 3DB
   United Kingdom

   06758924002

   Patents ADP number *(if you know it)*

   If the applicant is a corporate body, give the country/state of its incorporation — Great Britain

4. Title of the invention — Packaging Apparatus

5. Name of your agent *(if you have one)* — Gill Jennings & Every

   "Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

   Broadgate House
   7 Eldon Street
   London
   EC2M 7LH

   Patents ADP number *(if you know it)* — 745002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*
   a) any applicant named in part 3 is not an inventor, or
   b) there is an inventor who is not named as an applicant, or
   c) any named applicant is a corporate body.
   See note (d)) — YES

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9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	5
Claim *(s)*	2
Abstract	-
Drawing *(s)*	1 +1 SVF

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	NO

11. For the applicant
Gill Jennings & Every

I/We request the grant of a patent on the basis of this application.

Signature [signature] Date 8 July 2003

12. Name and daytime telephone number of person to contact in the United Kingdom

SKONE JAMES, Robert Edmund
020 7377 1377

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PACKAGING APPARATUS

This invention relates to an apparatus and method for packaging a product such as a snack food product and in particular, to the control of the quantity of an additive, such as a flavouring applied to the product.

Vertical form-fill seal packaging machines are well known for the packaging of products such as potato chips. They are typically used in conjunction with a combinational weigher which produces batches of products with a defined weight. The combinational weigher has a plurality of hoppers, each of which contains a quantity of the product. The combinational weigher then supplies the required batch weight by releasing the contents of one or more of the hoppers such that the combined weight of the contents of the hoppers equals the required weight of the batch. An additive, such as a flavouring is typically applied to the product prior to the combinational weighing process and the batch of product supplied by the combinational weigher is packaged by the form-fill seal packaging machine.

However, a problem exists with this process in that the quantity of additive supplied to the product by a dispenser is not well controlled, in particular if the dispenser requires cleaning. In this case, it may have become clogged and deliver lower quantities of additive than required.

In accordance with one aspect of the present invention, there is provided an apparatus for packaging a product, the apparatus being adapted to apply an additive to the product and comprising a weigher for dispensing a predetermined quantity of the product; a dispenser for supplying a quantity of the additive to the dispensed quantity of the product to produce a mixture; and, a packaging machine to which the dispensed quantity of product and quantity of additive are supplied, the packaging machine packaging the dispensed quantity of product and quantity of additive in a package, wherein the

apparatus further comprises a check weigher for monitoring the combined weight of the package and the mixture; and a controller adapted to control the dispenser in response to an output from the check weigher in order to adjust the quantity of additive supplied such that the combined weight of the package and the mixture meets predetermined requirements.

In accordance with a second aspect of the present invention, there is provided a method for packaging a product, the method comprising dispensing a predetermined quantity of the product; supplying a quantity of additive to the dispensed quantity of product to produce a mixture; and, packaging the dispensed quantity of the product and the quantity of additive in a package, wherein the method further comprises monitoring the combined weight of the package and the mixture; and adjusting the quantity of additive supplied such that the combined weight of the package and the mixture meets predetermined requirements.

In this specification, by "quantity" we include number, weight, volume or any other measure suitable for the product concerned.

Hence, the invention provides an apparatus and method for packaging a product in which the quantity of additive applied can be adjusted to meet predetermined requirements and prevents variations in the quantity of additive that is dispensed.

Typically, the dispensed quantity of product and quantity of additive are mixed in a mixer upstream of the packaging machine in order to produce the mixture and, in a preferred embodiment, the mixer comprises an Archimedean screw.

The weigher used may be any type of weigher but typically, it is a combinational weigher for example of the type manufactured by Ishida Co., Ltd.

Preferably, the packaging machine is a vertical form fill seal packaging machine such as an Apex or Atlas machine as manufactured by Ishida Co., Ltd.

Any variety of dispenser may be used with the apparatus but normally, the dispenser comprises a bulk hopper and a compressed gas transport. The gas used may be, for example, nitrogen or air.

The apparatus and method may be used with any variety of products, for example, a foodstuff such as potato chips.

The additives may take a variety of forms including flavourings such as salt or spices, vitamins, flavouring sachets which allow a purchaser to add the flavouring himself as required, or non-food items such as tokens, novelty toys and the like. The additives may be in a variety of forms, including liquid, powder and particulate forms.

Flavourings typically include seasoning such as salt or spices but may also include other particulate, powder or liquid additives that typically require to be applied reasonably uniformly. Flavourings also include "chemical" flavours commonly defined by "E numbers" such as cheese and onion flavour.

An embodiment of the invention will now be described with reference to the accompanying drawing, Figure 1, which shows apparatus for performing the invention.

Figure 1 shows a combinational weigher 1 which operates as previously described to supply a desired, predetermined quantity of a snack food product, such as potato chips to a mixer 4 via a chute 1a. The mixer 4 is also supplied with flavouring from a flavouring dispenser 2 via a compressed gas transport 3.

The flavouring dispenser 2 comprises a bulk hopper in which the flavouring is stored and an Archimedean screw, within the hopper delivers a quantity of the flavouring to the compressed gas transport 3 for delivery to the mixer 4.

The mixer 4 comprises an Archimedean screw, the rotation of which causes the snack food product and flavouring to mix thoroughly as they traverse along its length. The mixture of the snack food product and flavouring emerge from the far end of mixer 4 and fall into

the loading chute of a vertical form-fill seal packaging machine 5.

This type of packaging machine is well known to those skilled in the art and hence only a brief description is given here. Film from a reel 6 is drawn over a former 7 into the machine and a continuous longitudinal seal is formed between the edges of the film using a longitudinal sealer 8. The mixture of snack food product and flavouring falls down the loading chute into a bag formed from the film. The bags are formed using transverse sealers 9a, 9b which come together to form a seal for the top of one bag and the bottom of the next bag, against which the mixture comes to rest. The transverse sealers 9a, 9b also have a cutter which separates each bag from the next.

A bag 10 is shown in Figure 1 which contains a predetermined quantity of the snack food product and a quantity of the flavouring that have been mixed together by mixer 4. This bag 10 then drops onto a check weigher 11.

The check weigher 11 comprises a conveyor belt 12 that is supported on a load cell 13. As the bag proceeds along the conveyor belt 12, the load cell 13 monitors the weight of the bag 10 and its contents. The bag 10 on leaving conveyor 12 proceeds along a production line (not shown) in a conventional fashion. The resolution of the check weigher 11 is typically in the region of 0.05g to 0.1g.

An output signal from the load cell 13 is supplied to a controller 14 which issues its own output signal to the flavouring dispenser 2 in response to the signal from the load cell 13. The output signal from controller 14 is used to adjust the quantity of flavouring supplied such that the combined weight of the bag 10 and its contents meet predetermined requirements.

The controller 14 has a memory that stores the weight of the film used to make bag 10 which is input by a user prior to operation of the apparatus. It also receives the weight of snack food products supplied to the mixer 4 from combinational weigher 1. Using these two weights and the

weight of the bag and its contents monitored by load cell 13, it is possible for controller 14 to determine the quantity of flavouring that was supplied by the flavouring dispenser 2.

For small errors in the quantity of flavouring supplied, the controller 14 may adjust the quantity of flavouring supplied by the flavouring dispenser 2 to compensate for this error. Alternatively, if the error is large, then controller 14 may indicate to an operator using display 15 that the flavouring dispenser 2 requires cleaning or refilling. In this event, controller 14 may be adapted to stop the production line and prevent further production of product with an incorrect amount of flavouring.

For example, the weight of film used to form a bag is typically in the region of 2g to 4g depending on the size of the bag to be formed and the weight of the mixture of snack food product and flavouring is typically around 30g. The weight of flavouring supplied depends on the product and the flavouring but is normally in the region of 2% to 15% of the total weight of the mixture and, in this example, the weight of flavouring desired is 3g. Therefore, with a bag weight of 3g and a weight of snack food product supplied (as indicated by the combinational weigher 1 to the controller 14) of 27.5g, it can be seen that if the check weigher 11 indicates that the total weight of the bag and contents is 32.5g then only 2g of flavouring have been supplied rather than the desired 3g. Therefore, the controller 14 will cause the flavouring dispenser 2 to increase the amount of flavouring supplied to the mixer 4 for mixing each bag of snack food product in order to overcome this error.

CLAIMS

1. Apparatus for packaging a product, the apparatus being adapted to apply an additive to the product and comprising a weigher for dispensing a predetermined quantity of the product; a dispenser for supplying a quantity of the additive to the dispensed quantity of the product to produce a mixture; and, a packaging machine to which the dispensed quantity of product and quantity of additive are supplied, the packaging machine packaging the dispensed quantity of product and quantity of additive in a package, wherein the apparatus further comprises a check weigher for monitoring the combined weight of the package and the mixture; and a controller adapted to control the dispenser in response to an output from the check weigher in order to adjust the quantity of additive supplied such that the combined weight of the package and the mixture meets predetermined requirements.

2. Apparatus according to claim 1, wherein the dispensed quantity of product and quantity of additive are mixed in a mixer upstream of the packaging machine in order to produce the mixture.

3. Apparatus according to claim 2, wherein the mixer comprises an Archimedean screw.

4. Apparatus according to any of the preceding claims, wherein the weigher is a combinational weigher.

5. Apparatus according to any of the preceding claims, wherein the packaging machine is a vertical form fill seal packaging machine.

6. Apparatus according to any of the preceding claims, wherein the dispenser comprises a bulk hopper and a compressed gas transport.

7. A method for packaging a product, the method comprising dispensing a predetermined quantity of the product; supplying a quantity of additive to the dispensed quantity of product to produce a mixture; and, packaging the dispensed quantity of the product and the quantity of

additive in a package, wherein the method further comprises monitoring the combined weight of the package and the mixture; and adjusting the quantity of additive supplied such that the combined weight of the package and the mixture meets predetermined requirements.

8. A method according to claim 7, wherein the mixture is produced by mixing the dispensed quantity of the product with the quantity of the additive prior to packaging.

9. A method according to claim 7 or claim 8, wherein the the product is dispensed by a combinational weigher.

10. A method according to any of claims 7 to 9, wherein the dispensed quantity of the product and the quantity of additive are packaged using a vertical form fill seal packaging machine.

11. A method according to any of claims 7 to 10, wherein the product is a foodstuff.

12. A method according to claim 11, wherein the foodstuff is potato chips.

13. A method according to any of claims 7 to 12, wherein the additive is a flavouring.

14. Apparatus substantially as hereinbefore described with reference to the accompanying drawings.

15. A method substantially as hereinbefore described with reference to the accompanying drawings.

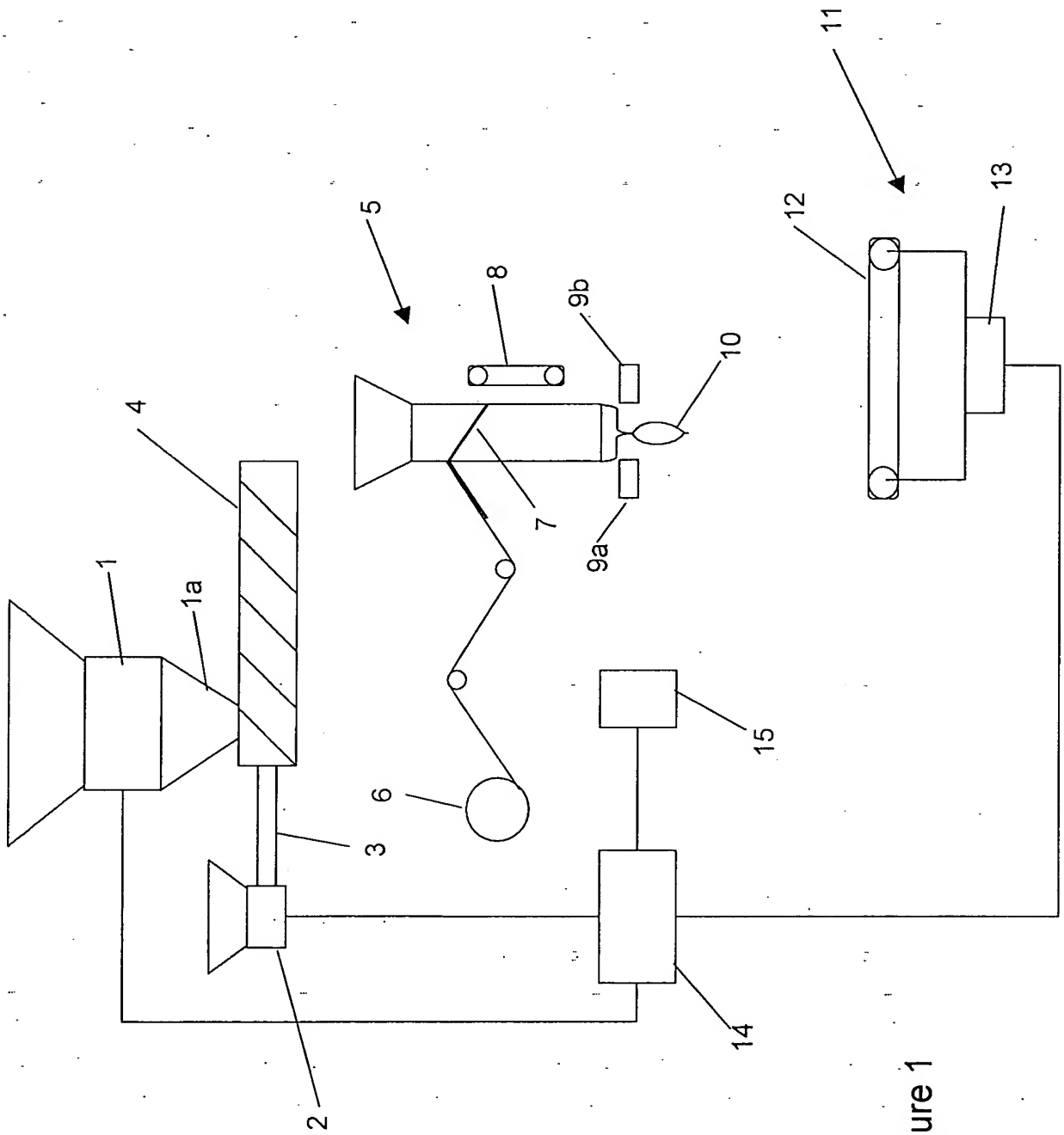

Figure 1